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# Compliance Assistance for Biodiesel Production Plants

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Department of Natural Resources fact sheet

4/2008

**Disclaimer:** The statements in this document are intended solely as guidance and as a service to facilitate the permit application process, not as legal advice. This document is not a substitute for obtaining proper legal or technical advice specific to any particular situation, nor can it be relied upon to create any rights enforceable by any party in litigation. Rather, the applicant is responsible for complying with all federal, state and local laws. It is recommended that you consult a competent attorney who specializes in the field of environmental law on issues concerning liability. This document may be revised without public notice to reflect changes in law, regulation or policy.

Biodiesel production in Missouri is relatively new and interest in expanding the industry seems to be high. This fact sheet is designed to help those considering and planning the construction of new biodiesel production plants. The Missouri Department of Natural Resources has several fact sheets relevant to this subject available on the department's Web site as well as listed at the end of this publication. Facilities may also visit [www.biodiesel.org](http://www.biodiesel.org) for information on the production processes for biodiesel fuel.

## Planning Assistance

Biodiesel production facilities are often subject to a variety of environmental regulations and permitting, even if your expected production levels are small. Arrange to meet with Department of Natural Resources officials early in the planning process to be certain your business plans include all air, water and land environmental permitting and siting issues. Call the department's Division of Environmental Quality at (573) 522-9911 or 1-800-361-4827 to set up a no-cost multi-media pre-application meeting.

A quick way to get an overview of the types of permits you may need is to visit the department's online Permit Assistant at [www.dnr.mo.gov/mopermitassistant/](http://www.dnr.mo.gov/mopermitassistant/). The department designed this tool to help users determine what type of environmental permits they need and provide the forms necessary to apply for these permits. This easy-to-use tool will ask the user a few simple questions to determine the user's needs.

## Water Pollution

Most biodiesel facilities in Missouri require operating permits issued by the department's Water Protection Program. These include land disturbance permits for land clearing and construction efforts, as well as permits to control contaminants from operating biodiesel facilities, such as storm water and process wastewater. Exceptions include those facilities that do not have a process wastewater discharge, and those that receive a No Exposure Certification (i.e. no contaminants exposed to precipitation. See [www.epa.gov/npdes/pubs/noexpoform\\_app4.pdf](http://www.epa.gov/npdes/pubs/noexpoform_app4.pdf)).

Storm water operating permits are required for facilities with the potential to discharge contaminated storm water. This includes facilities with raw or intermediate materials, finished product or wastes stored outside exposed to precipitation. Potential contaminants include spilled oils, glycerin, soap stock, etc. The department has developed a general storm water permit, MOR23A, that may be applicable as long as a biodiesel facility does not perform blending with petroleum diesel and does not use glycerin disposal practices such as composting and land application.

Site specific wastewater operating permits are required for most biodiesel facilities. Sources of contamination from biodiesel facilities include storm water and process wastewater. Exceptions to the permit requirement would be facilities without a process wastewater discharge and a No Exposure Certification (i.e. no contaminants exposed to precipitation.)

Process wastewater sources include the separator, neutralization, wash water and methanol recovery steps. Water used in these steps pick up contaminants, such as salts, soap, biodiesel and methanol. These contaminants pose a threat to water quality, which requires the department to establish effluent limitations in a site-specific operating permit. Facilities that plan to discharge their process wastewater to another permitted facility, such as city sewer system, do not need a state operating permit for their process wastewater, but may need a pretreatment permit from the local wastewater utility. This wastewater has a very high oxygen demand and the ability of the local treatment plant to handle it will be a real concern to the utility in setting your effluent limits.

A site specific permit is required if the proposed facility discharges process wastewater, or if it does not qualify for a general storm water permit. A site specific permit is also available to any facility that requests it, as general permits are required to be conservative and protective of sensitive waterbodies. Therefore it is sometimes advantageous for a facility discharging to a water body that is not highly sensitive to obtain a site specific permit, because it can result in high effluent limits. However, the annual fees for a site specific permit are considerably more expensive.

If you are planning to construct a new biodiesel facility and plan to discharge process wastewater, please submit an application for Water Quality Review Assistance. The application is available on the Web at [www.dnr.mo.gov/forms/780-1893.pdf](http://www.dnr.mo.gov/forms/780-1893.pdf). This will provide you with the effluent limits that will apply to your facility, allowing you to better plan for managing the wastewater. In addition, any facility applying for a site specific permit after Aug. 29, 2008, will have to undergo a level of Antidegradation Review. This will apply to new and expanded facilities only. Contact the Water Protection Program for additional details and assistance.

Construction permits are not required unless a facility is constructing a wastewater treatment device. This will generally only apply to a facility with a process wastewater treatment system.

A land disturbance permit will be required for new facilities that disturb an acre or more of land. A general permit is available for land disturbance. Like all other discharge permits, a land disturbance permit is conditioned upon the location of the discharge relevant to protected waters such as losing streams, outstanding national or state resource waters, reservoirs or lakes used for public drinking water supplies or those listed as impaired waters. This permit does not apply for land disturbance storm water discharges where any of the disturbed area is defined as a wetland or the storm water discharges to a sinkhole or other direct conduit to groundwater.

## Permit Timing

A facility requiring a site specific operating permit is to submit the application at least 180 days prior to beginning to discharge. A public notice with a 30 day comment period is included in that time frame. A public hearing may also be held if one is requested. A facility eligible for a general permit is to submit the application at least 60 days before construction begins. General permits take about 30 days to review and require no site specific public notice.

Improper release of biodiesel production wastewater will have very serious affects on receiving waters. A serious fish kill and a complete municipal wastewater treatment plant upset have occurred in Missouri as a result of biodiesel production wastewater releases.

## Air Pollution

The department requires a facility to submit a construction permit for the construction of new air pollution sources or modification of existing sources. This permit is required prior to commencing construction unless the installation applies for and receives a pre-construction waiver. No construction permit is required if the potential emissions of an entire installation are less than regulatory de minimis levels or if potential emissions of a proposed project are below insignificant levels.

## **Emission Levels Pertaining to Air Permitting (tpy - tons per year)**

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\* Emission levels will vary from facility to facility and these figures may not be assumed.

\*\* The insignificant level for HAPs is the lesser of 0.5 lb./hr or its hazardous emission threshold as established in subsection (12)(J) of 10 CSR 10-6.060.

\*\*\* 10 tpy per HAP or 25 tpy for the total of all HAPs.

Potential emissions of the proposed project determine the type of construction permit needed. Potential emissions are calculated based on maximum design capacity of the installation assuming continuous year-round operation. Emission factors used to calculate potential to emit could come from EPA sources, stack test or engineering data. Biodiesel emission sources include oil pretreatment, biodiesel process, boilers, leaks, loadout, haul roads, uncontrolled storage tanks and cooling towers.

**There are three types of air construction permits:**

- **De Minimis Construction Permits (Section 5)** - De Minimis permits are issued for existing facilities with a new project with potential emissions of less than or equal to state de minimis levels. A new installation with project potential emissions greater than de minimis levels can request a permit condition limiting its plant wide emissions to de minimis.
- **Minor Construction Permits (Section 6)** - Minor permits have project potential emissions greater than de minimis, but less than major permitting levels. Installations obtaining minor source permits require air modeling to demonstrate compliance with air increment and National Ambient Air Quality Standards. Installations with potential emissions of sulfur oxides or particulate matter greater than 50 tons per year are required to submit ambient air quality modeling data.
- **Major Review Permits (Sections 7, 8)** – Major review permits follow federal emissions thresholds and guidelines and therefore require additional technical review for control technology planned, air dispersion modeling and public notice.

### **Permit Timing**

For De Minimis and Minor Permits, the department has a statutory requirement to complete the projects within 90 days from receipt of a complete application. The department has a statutory requirement to complete Major Reviews within 184 days. The department does stop the clock if the department requests additional necessary information from the applicant.

Co-locating a new biodiesel plant with a new soybean oil extraction plant can significantly affect the construction permit, as it might be necessary to consider them the same installation.

Air Operating Permits are issued to all installations with potential emissions greater than de minimis levels or that have new source standards to meet. The air construction permit allows the installation to construct and operate. In addition, the construction permit details the type of operating permit required and the time frame allowed for the installation to submit the operating permit application.

A number of federal performance standards and control technologies may apply to biodiesel production facilities. These include the following standards:

### **40 CFR Part 60 - New Source Performance Standards:**

- Subpart Kb, for Volatile Organic Liquid Storage Vessels.
- Subpart Dc, for Small Industrial/Commercial/Institutional Steam Generating Units.
- Subpart NNN, for Volatile Organic Compound Emissions from the Synthetic Organic Chemical Manufacturing Industry Distillation Operations.
- Subpart RRR, for Volatile Organic Compound Emissions from Synthetic Organic Chemical Manufacturing Industry Reactor Processes.
- Subpart VV, for Equipment Leaks of Volatile Organic Compound Emissions in the Synthetic Organic Chemical Manufacturing Industry.

## **40 CFR Part 63, Maximum Achievable Control Technology Standards:**

- Subpart FFFF, National Emission Standards for Miscellaneous Organic Chemical Production and Processes.
- Subpart DDDDD, National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers and Process Heaters.

If any of these standards apply, an air operating permit will be required even if emission levels do not trigger a construction permit.

## **Solid Waste**

Biodiesel production facilities, like most facilities, will generate solid waste. Common activities that generate solid waste include:

- Office paper, cardboard, plastic, metal and glass food and beverage containers.
- Food waste from cafeteria or break room operations.
- Used engine oil, antifreeze, batteries and similar waste generated from fork lifts, cars and trucks.
- Office equipment and appliances, such as computer monitors and hard drives, printers and copy machines, televisions and microwave ovens.
- Packaging from materials received at a facility, such as foam, strapping and lumber.
- Wastes associated with heating and air conditioning systems and building maintenance.
- Used chemicals, sludge from process tank clean-outs and other wastes generated from production.

It is important to reduce, reuse and recycle. All businesses must recycle computers and fluorescent bulbs, unless they are managed as a hazardous waste. Used oil and lead-acid batteries are banned from disposal in landfills in Missouri. All solid waste must be taken to recyclers for recovery, reuse or to a permitted solid waste facility for proper disposal.

**Note:** Some landfills have experienced problems with fires of waste materials containing diatomaceous earth, a substance used as a filter by some biodiesel plants for final filtration and the soy refining process. Research is underway to determine the cause of this problem.

## **Hazardous Waste**

Facilities that generate hazardous waste are required to meet design, construction and location requirements of areas where the waste is stored. In addition, facilities are required to meet construction requirements of tanks and containers that store waste, how tanks and containers are marked, labeled, dated, etc., how records are kept, what reports are made and when, and how waste is shipped and disposed. Along with the costs of these activities, there may be significant hazardous waste generation fees as well.

The following waste streams may be regulated as hazardous:

- Strong acids or bases (unused excess, off-specification materials, spent materials).
- Wash water wastes not discharged to an approved wastewater treatment plant.
- Methanol waste that is not reclaimed.
- Materials from the transesterification process, such as sulfuric acid.
- Paint waste.
- Washer solvent.
- Sludges from floor drains, sand pits.
- Parts washer solvent, sludges or filters.
- Aerosol cans.
- Glycerin (that cannot be reclaimed for further use or is sent off-site).

In addition, the following waste streams may require special handling:

- Mercury containing lamps, such as fluorescent or high intensity discharge lamps.
- Electronics.
- Used oil.

### **Glycerin as hazardous waste**

During biodiesel production, a chemical process called transesterification creates glycerin as a significant by-product, relative to the oil processed. The glycerin is contaminated with methanol or ethanol depending on the production process used by the facility. If the contaminated glycerin has a flashpoint below 60 C (140 F), it is an ignitable hazardous waste. If the contaminated glycerin has a pH less than or equal to 2.0, or greater than or equal to 12.5, it is a corrosive hazardous waste.

A way to avoid hazardous waste regulation of a facility's glycerin is to show the glycerin produced by a biodiesel plant is marketable. If business records show at least 75 percent, by weight or volume, of the ignitable glycerin produced in one calendar year is used as a feedstock, then a facility is not required to manage the material as a waste. Contracts, inventories, sales records, invoices and other business records will help show that enough of the glycerin is being marketed and is not being "accumulated speculatively" or being stored in lieu of disposal. If a facility is unable to market sufficient glycerin to meet this standard, then the facility will have to determine if the glycerin is hazardous waste.

Investing in the process to ensure the glycerin produced is either not hazardous waste, or that it meets the necessary quality constraints in today's markets to be readily marketable and is being recycled in the required amounts, could be money well spent.

## **Underground Storage Tanks**

An underground storage tank is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The underground storage tank regulations apply only to the tanks and piping storing either petroleum or certain hazardous substances. Straight unblended biodiesel fuel is not regulated under underground storage tank rules. Regulated underground storage tanks are required to meet the following standards:

- **Corrosion Protection** - To assure steel underground storage tank systems do not rust over time.
- **Spill Protection** - The installation of a spill bucket or catchment basin around the fill pipe.
- **Overfill Prevention** - Overfill prevention equipment is designed to alert the delivery driver the tank is almost full.
- **Leak Detection** - Underground storage tanks are required to have leak detection methods for its tanks and piping.

## **Federal Spill Prevention Control and Countermeasure Requirements**

Preparation and using a Spill Prevention, Control and Countermeasure plan is the main requirement for regulated facilities to prevent any discharge of oil into waters of the United States. The plan requirements (40 CFR 112) apply if the aggregate above ground storage capacity is 1,320 gallons or greater and the oil can reach navigable waters if a release occurs. The term oil means oil of any kind or in any form, including, but not limited to:

- Petroleum.
- Fuel oil.
- Sludge.
- Oil refuse.
- Oil mixed with wastes other than dredged spoil.
- Fats, oils or greases of animal, fish or marine mammal origin.
- Vegetable oils, including oil from seeds, nuts, fruits or kernels.
- Other oils and greases, including synthetic oils and mineral oils.

The aggregate above ground storage capacity of the facility is determined by adding the total volumetric capacity of all the containers storing oil, including vegetable oils, that are 55 gallons and greater. If the above ground aggregate capacity reaches 1,320 gallons or more then the facility must have a Spill Prevention, Control and Countermeasure Plan approved by a professional engineer. For underground storage, a Spill Prevention, Control and Countermeasure Plan would be required only if the storage capacity is greater than 42,000 gallons of petroleum, not including any capacity stored in underground storage tanks regulated under 40 CFR 280 at the facility. The plan outlines the measures a facility will take to control and respond to an oil release at the site. The U.S. Environmental Protection Agency administers the Spill Prevention, Control and Countermeasure program under federal regulations. More information about the EPA program is available on the Web at [www.epa.gov/reg3hwmd/oil/spcc/index.htm](http://www.epa.gov/reg3hwmd/oil/spcc/index.htm).

## **Spill Reporting and Notification**

If a spill occurs, it is the responsibility of the person who possesses or controls the hazardous substance or who causes the spill to notify the Missouri Department of Natural Resources by calling the 24-hour Environmental Emergency Response Hotline at (573) 634-2436. The responsible party must determine whether a released substance is hazardous based on quantity, physical and chemical characteristics of the substance.

Chapter 260.500 - 260.550 RSMo, referred to as the Missouri Spill Bill, provides the Missouri Department of Natural Resources' legal authority to ensure that releases of hazardous substances are reported to the State of Missouri and adequately cleaned up. The law further specifies that the department "may require the person having control (responsible party) over a hazardous substance in the hazardous substance emergency to clean up the hazardous substance and take any reasonable actions necessary to end a hazardous substance emergency." The law allows for the department to conduct the cleanup if certain actions are not met in a timely manner. In addition, the law allows the department to recover costs incurred by the State of Missouri for cleanup oversight. For more information about state reporting and cleanup requirements, see chapters 260 - 500 through 260 - 550 at [www.moga.state.mo.us/statutes/c260.htm](http://www.moga.state.mo.us/statutes/c260.htm).

There are federal reporting requirements for any discharged material considered an oil or contains an oil material which includes non-petroleum oils such as vegetable oils. See [www.uscg.mil/vrp/faq/planreq.shtml#pr2](http://www.uscg.mil/vrp/faq/planreq.shtml#pr2) for a definition of oil and a list of materials considered an oil. If an oil discharge threatens or impacts (visible sheen) a navigable waterway, the responsible party is required to report the discharge to the National Response Center at 1-800-424-8802. It is recommended that the responsible party also contact the Missouri Department of Natural Resources 24-hour Environmental Emergency Response hotline at (573) 634-2436.

## **Community Right To Know**

The production of biodiesel involves various chemicals such as methanol, sodium hydroxide, potassium hydroxide, ethyl acetate, sodium methylate, sulfuric acid and glycerin. Emergency Planning and Community Right-to-know Act and Superfund Amendments and Reauthorization Act Sections 311 and 312 require facilities storing hazardous chemicals on-site to report this to local emergency authorities. The Missouri Emergency Response Commission handles emergency planning and administration of the Community Right-to-Know Act. This act requires chemical inventory reporting to county and local emergency response organizations. A facility must submit a report when all of the following conditions are met:

- The facility is subject to the OSHA Hazard Communication Standard.
- The facility uses, produces or stores a hazardous chemical or an extremely hazardous substance.
- The quantity of hazardous chemicals or extremely hazardous substances is in excess of the threshold quantity.

The definition for hazardous chemicals and the list of extremely hazardous substances, along with the reporting thresholds for each are in the Emergency Planning and Community Right-to-Know guidance available on the Web at [yosemite.epa.gov/oswer/Ceppoweb.nsf/content/epcraOverview.htm](http://yosemite.epa.gov/oswer/Ceppoweb.nsf/content/epcraOverview.htm)

For more information, contact your county government emergency management coordinator and local fire department about reporting chemical usage at your facility. For information on community right-to-know and registration of hazards go to [sema.dps.mo.gov/mercc.htm](http://sema.dps.mo.gov/mercc.htm)

## References

The Missouri Department of Natural Resources has several fact sheets facilities may find useful available on the department's Web page at [www.dnr.mo.gov/pubs/index.html](http://www.dnr.mo.gov/pubs/index.html). These documents can assist in understanding how the laws and regulations may apply and provide helpful information on technical issues. Most permit forms are also located on the department's Web site and are available to be downloaded at [www.dnr.mo.gov/forms/index.html](http://www.dnr.mo.gov/forms/index.html).

Additional publications developed specifically for the biofuels industry include:

*Developing Biofuel Production in Missouri* - [www.dnr.mo.gov/pubs/pub1347.pdf](http://www.dnr.mo.gov/pubs/pub1347.pdf)

Documents describing all of Department of Natural Resources' environmental permits and regulations include:

*Environmental Permits and How to Obtain Them* - [www.dnr.mo.gov/pubs/pub98.pdf](http://www.dnr.mo.gov/pubs/pub98.pdf)

*Understanding Environmental Regulations and Permits* - [www.dnr.mo.gov/pubs/pub595.pdf](http://www.dnr.mo.gov/pubs/pub595.pdf)

Facilities may also call a regional office or program listed below to ask additional questions.

**Missouri Department of Natural Resources 24-hour Environmental Emergency Response hotline at (573) 634-2436**

### Division of Environmental Quality

Air Pollution Control Program	(573) 751-4817
Hazardous Waste Program	(573) 751-3176
Land Reclamation Program	(573) 751-4041
Solid Waste Management Program	(573) 751-5401
Water Protection Program	
Public Drinking Water Branch	(573) 751-5331
Water Pollution Control Branch	(573) 751-1300

### Field Services Division

Environmental Services Program	
Environmental Emergency Response	(573) 634-2436
Kansas City Regional Office	(816) 622-7000
Northeast Regional Office	(660) 385-8000
St. Louis Regional Office	(314) 416-2960
Southeast Regional Office	(573) 840-9750
Southwest Regional Office	(417) 891-4300

## For More Information

Missouri Department of Natural Resources  
P.O. Box 176  
Jefferson City, MO 65102-0176  
1-800-361-4827 or (573) 522-9911  
[www.dnr.mo.gov/env/index.html](http://www.dnr.mo.gov/env/index.html)